



THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Michael Shipman

Serial No: '09/500,735

Filed: 'February 2, 2000

Title: KEYBOARD HAVING
ILLUMINATED KEYS

Art Unit: 2875

Date: July 7, 2000

*1/1/00
Patent to
make Special*

**PETITION TO MAKE SPECIAL
PURSUANT TO 37 C.F.R. § 1.102(d)**

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Sir:

Applicant respectfully requests that the above-identified patent application be made
— special. This petition is made pursuant to 37 C.F.R. § 1.102(d). With reference to
M.P.E.P. § 708.02, in accordance with the following, Applicant is believed to have met all
of the provisions required of 37 C.F.R. § 1.102(d).

A. Fee

The fee set forth in 37 C.F.R. § 1.17(i) is submitted herewith.

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B. Claims Directed to a Single Invention

Set forth below are the claims of the present application.

1. A lighted keyboard comprising:

a keyboard housing;

a plurality of key members positioned within said housing, said key members being constructed at least partially of a substantially translucent material for communicating light rays through said key members; and

a luminescent planar sheet for producing light, said luminescent planar sheet underlying said plurality of key members and being optically connected to said key members so as to permit the transmission of light to said key members.

2. The lighted keyboard of Claim 1 further comprising a circuit board underlying said plurality of key members, said circuit board being operational to produce signals in response to depression of said key members.

3. The lighted keyboard of Claim 2 wherein said luminescent planar sheet is disposed between said circuit board and said key members.

4. The lighted keyboard of Claim 3 wherein said luminescent planar sheet is formed with a plurality of holes, said holes underlying said key members for permitting the depression of said key members to cause the key members to project through said holes to impact said circuit board.

5. The lighted keyboard of Claim 2 further comprising an elastic diaphragm for biasing said key members upwardly, said luminescent planar sheet being disposed between said elastic diaphragm and said circuit board.

6. The lighted keyboard of Claim 2 wherein said luminescent planar sheet underlies said circuit board.

All of the claims are believed to be directed to a single invention. If the Patent Office determines that all claims presented are not directed to a single invention, Applicant agrees that it will make an election without traverse.

C. Preexamination Search

Preexamination searches were made of Applicant's invention. The searches were conducted primarily in the following classes and subclasses:

Class: 345, subclass: 170; and

Class: 385, subclass: 901.

The following references were uncovered in Applicant's searches.

<u>U.S. Patent No.</u>	<u>Issue Date</u>	<u>Inventor</u>	<u>Class</u>	<u>Subclass</u>	<u>Filing Date</u>
3,886,544	5/27/75	Narodny	340	365 P	6/12/74
3,934,245	1/20/76	Mueller	340	324 R	11/5/73
4,727,357	2/23/88	Curtin et al.	340	365 P	6/8/84
5,034,602	7/23/91	Garcia, Jr. et al.	250	227.22	7/21/89
5,045,755	9/3/91	Appelberg	313	498	1/24/90
5,097,396	3/17/92	Myers	362	32	9/25/90
5,899,553	5/4/99	Howell	362	84	4/17/96
5,975,711	11/2/99	Parker et al.	362	24	6/9/97
5,871,088	2/16/99	Tanabe	200	514	3/28/96
5,797,482	8/25/98	LaPointe et al.	200	314	11/25/96
5,807,002	9/15/98	Tsai	400	494	8/26/97
5,747,756	5/5/98	Boedecker	200	5 A	9/10/96
5,512,718	4/30/96	Larose	200	314	10/14/94

5,993,019	11/30/99	Kline et al.	362	29	10/3/97	✓
5,510,782	4/23/96	Norris et al.	341	22	8/3/92	✓
5,432,684	7/11/95	Fye et al.	362	30	1/11/94	✓
5,384,459	1/24/95	Patino et al.	250	229	6/1/93	✓
4,806,908	2/21/89	Krupnik	341	22	5/14/87	✓
4,489,227	12/18/84	Lamarche	200	314	1/11/84	✓
4,177,501	12/4/79	Karlin	362	26	11/15/77	✓
4,670,633	6/2/87	Kaiwa et al.	200	314	10/19/84	✓
4,449,024	5/15/84	Stracener	200	317	5/3/83	✓
5,542,016	7/30/96	Kaschke	385	123	1/13/95	✓
4,124,879	11/7/78	Schoemer	362	26	5/20/77	
Des. 311,913	11/6/90	Schaum	D14	114	4/22/87	

D. Submission of References

A copy of all references uncovered in Applicant's searches are submitted herewith.

E. Detailed Discussion of References

U.S. Patent No. 3,886,544

This reference is directed to typewriter keyboards which utilize fiberoptic switches at each key. Two fiberoptic cables are routed to each key with a first cable provided to provide light to the key with the second fiberoptic cable provided to receive light from the

key. As best shown in Figs. 2 and 3, and as described in column 8, lines 4 - 17 of the patent, the light is routed to an ellipsoidal reflector formed in the individual key bases. Upon depression of the individual keys, light is made to reflect off the reflector to be received by fiberoptic cable 48.

U.S. Patent No. 3,934,245

This reference is directed to a light emitting display unit for attachment to the keys of a computer keyboard. This device is extremely cumbersome in which fiberoptic cables are externally routed to the keys of a keyboard and then attached to individual keys by a rigid frame 18. As best shown in Figs. 6 and 7, the rigid frame 18 is connected to a fiberoptic cable 20. Based upon operation of a switching system 16, the fiberoptic cable 20 is illuminated to display a symbol on a display matrix 34.

U.S. Patent No. 4,727,357

This reference describes an alphanumeric keypad. Next to the individual keys is a character formation key 4 including sixteen light emitting bars, 6 - 36. These bars, preferably liquid crystal displays (LCDs), emit light in various configurations to form various alphanumeric characters.

U.S. Patent No. 5,034,602

This reference describes a keypad having a plurality of keys in which each key is illuminated to form an illuminated character on the key's upper surface. Light is transmitted from an LED or LCD by a waveguide, such as a fiberoptic cable, to each individual key.

U.S. Patent No. 5,045,755

This reference which was incorporated into Applicant's patent application by reference describes an electroluminescent panel lamp.

U.S. Patent No. 5,097,396

This reference discloses a backlighting system for illuminating the keys of rubber keypads, membrane switches, liquid crystal displays, rigid panels and the like. Fiberoptic cables are routed to each individual key to provide illumination.

U.S. Patent No. 5,899,553

This reference describes a keypad which is illuminated using a luminescent panel. The luminescent panel is formed with a plurality of bores so that the keypad's keys can project through the bores. Instead of the keys providing luminescence, the areas around the keys are illuminated.

U.S. Patent No. 5,975,711

This patent is directed to a display panel for mobile phones and the like. The phone includes backlighting for two or more displays, the displays being illuminated by liquid crystal displays.

U.S. Patent No. 5,871,088

The '088 patent describes the use of an electroluminescent sheet for backlighting a switch plate.

U.S. Patent No. 5,797,482

The '482 patent is directed to an electroluminescent sheet for backlighting the keys of a keypad, such as a VCR remote control.

U.S. Patent No. 5,807,002

The '002 patent is directed to the manufacture of super-thin plastic keys.

U.S. Patent No. 5,747,756

This reference is directed to a keypad, instead of a keyboard, wherein the keys of the keypad are formed of a flexible surface material. An electroluminescent panel is provided for backlighting the keys of the keypad.

U.S. Patent No. 5,512,718

This reference describes a keypad in which each key is illuminated by individual light sources. There is no suggestion that the light source include a luminescent panel.

U.S. Patent No. 5,993,019

This reference is directed to backlit knobs or buttons for use in connection with automotive radios and the like.

U.S. Patent No. 5,510,782

This reference describes a relatively complicated method of manufacturing a keypad including illuminated characters, and the keypad formed by such methods. However, the reference does not describe how the individual keys are backlit.

U.S. Patent No. 5,432,684

This reference describes a method of manufacturing an instrument panel having backlit components of an automobile instrument panel.

U.S. Patent No. 5,384,459

This reference is directed to a keypad illuminated by a lamp and light pipes.

U.S. Patent No. 4,806,908

This reference is directed to a keypad having translucent full travel keys. Each key includes a bore with the bores longitudinally aligned so that a luminescent electroluminescent strip can project longitudinally through the bores to illuminate the key members.

U.S. Patent No. 4,489,227

This reference is directed to a keyboard having keys illuminated by lamps and light pipes. The alleged invention is directed to an electrical switch array including a bottom support plane having a plurality of projections extending upwardly. Mounted upon the top of these projections are corresponding key caps. Meanwhile, between the key caps and support plane are a resilient support and a membrane switch constructed with apertures for receiving the plurality of projections. The bottom support plane and projections are translucent to act as a light pipe for transmitting light from a nearby lamp.

U.S. Patent No. 4,177,501

This reference is directed to keypads for use in instrument panels and the like. A substantially translucent sheet acts as a light pipe for transmitting light from a nearby lamp to each of the key members.

U.S. Patent No. 4,670,633

This reference is directed to a keypad having illuminated keys which are illuminated by individual light sources such as LEDs. The keyboard attempts to minimize the number of light sources by placing the light sources between keys so that one light source may be used to illuminate two or more keys. In a preferred embodiment, each light source illuminates four adjacent keys.

U.S. Patent No. 4,449,024

This reference is directed to a keypad including illuminated keys. The keys are illuminated by a single lamp which transmits light to a diffuser of clear plastic which underlays the key members.

U.S. Patent No. 5,542,016

This reference describes a cellular telephone including illuminated key members. The key members are illuminated by an optical fiber which is routed along a repeated recurrent pattern underlying the key members. The optical fiber is, in turn, illuminated by a separate light source.

U.S. Patent No. 4,124,879

This reference is directed to a cellular telephone including light pipes adjacent to transparent key members. A separate light source transmits light rays to the light pipe assembly which are adjacent to the transparent keys to provide illuminated key members.

U.S. Patent No. Des. 311,913

This design patent is directed to the ornamental design for a key cap.

APPLICANT'S CLAIMED INVENTION

Applicant's claimed invention is directed to a keyboard, such as a computer keyboard, which includes a luminescent planar sheet which produces light. The luminescent planar sheet underlies a plurality of key members of the keyboard for transmitting light to the key members so that light may be transmitted from the upper surfaces of the keys.

None of the prior art references describe the use of a luminescent planar sheet, such as a luminescent planar lamp described in the specification of the present application, which underlies the key members of a keyboard.

Instead, electroluminescent sheets are known for backlighting keypads¹, such as VCR remote controls and cellular telephones (see U.S. Patent Nos. 5,797,482 and 5,747,756). Meanwhile, keyboards have traditionally used LEDs or LCDs (see U.S. Patent No. 3,886,544), or individual fiberoptic cables (see U.S. Patent Nos. 3,934,245 and 5,034,602) to illuminate key members. However, there is no suggestion that a luminescent panel could be used to illuminate the key members of a keyboard, particularly within a construction wherein the luminescent panel underlies the key members.

CONCLUSION

Because the prior art does not disclose, or even suggest, a keyboard including a luminescent planar sheet underlying and illuminating a plurality of key members, Applicant's claimed invention is believed to be patentable. It is believed that the claims

¹ Some of these references use the word "keyboard" when describing keyboards.

now in this case are in condition for allowance and early notice thereof is respectfully solicited. If there are any remaining issues that need to be resolved, it is respectfully requested that a telephone call be placed to the undersigned.

Respectfully submitted,

DRUMMOND & DUCKWORTH



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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to:
Hon. Commissioner of Patents and Trademarks,
Washington, D.C. 20231, on July 7, 2000.

Cortney Gollands 7-7-00
Cortney Gollands Date